

question which has often been debated by the association, and now in later years, as the subject has assumed a more prominent place in all questions about the curricula of the universities and the secondary schools, the association has gradually focussed its view of it in favour of relaxation for candidates for admission at the university who are able to prove themselves worthy of high honours in mathematics or natural science.

MR. ARNOLD-FORSTER, Secretary of State for War, attended on Monday the first lecture of a course on military history and strategy at the University of London; and at the conclusion of the lecture spoke on army education. In the course of his remarks, he said:—If we have had one thing more than another to admire in the great military example in the Far East, it is the way in which the officers' corps of a great and friendly nation have succeeded in combining the maximum of devotion with the maximum of intelligence in the effective service of their country. In our Army we can find officers in every rank and branch of the service who will challenge comparison with the officers of any army in the world; but the diffusion of intelligence and education throughout the officers of the Army is not so great as it ought to be. This is not peculiar to the Army; it is characteristic of every profession in the country; and what this country is now feeling acutely is that we have so long subsisted on an educational basis inadequate to the needs of modern life. The time has come for the public schools to render to the Army greater service than they do now. Numbers of young men come up for the Army from the public schools with a totally inadequate knowledge of the language of every country but their own, and with an inadequate knowledge of the history and literature of their own country, as well as of the history and literature of every other country. That must all be changed. Young men ought to come up from the public schools instructed in the great science of geography. Now they are practically without any knowledge whatever of one of the sciences which, more than any other, is the reasonable foundation for the studies of an officer in the Army. There is an extraordinary lack in this country—which of all others ought to be well posted in this branch of science—of a proper knowledge of geography. We might be compelled to establish in this country for the Army schools like those which have been already established for the Navy, or like the college at West Point in the United States. The time has almost come when it would be wise to establish a great college like West Point, where the equipment, staff, and method should be as complete as possible, and where candidates should be taken not only for the Army, but for all the great departments of the State, and where even those who have no intention of entering the service of the State may be allowed to receive instruction.

## SOCIETIES AND ACADEMIES.

### PARIS.

**Academy of Sciences**, January 9.—M. Troost in the chair.—The external or superficial conductivity representing for a given body the cooling power of a fluid current: J. Boussinesq.—The micrographical study of the meteorite of the Diablo Canyon: H. Moissan and F. Osmond. The micrographical study of this meteorite has shown that the metallic parts, apparently homogeneous, frequently contain irregular microscopic nuclei formed of superposed layers of phosphide and carbide of iron. A detailed examination of nodules which have not been submitted to external oxidation made it clear that they are formed of sulphide of iron surrounded by successive layers of iron phosphide and carbide. In certain cases the laminated structure of the nodules showed that they had been submitted to very considerable pressures.—Trypanosomiasis and the tsetse-fly in French Guinea: A. Laveran. Specimens of Glossina, or the tsetse-fly, have been found in all parts of French Guinea, and in places where the existence of diseases due to trypanosomes has been already demonstrated. These trypanosomes attack horses as well as human beings, and a detailed account of the course of the disease in a horse, together with the results of a

post-mortem examination of the animal, are given.—Observations on the Borrelly comet (December 28, 1904) made with the large equatorial at the Observatory of Bordeaux: G. Rayet. Two sets of observations were made on December 31, 1904, and one on January 2. On the latter evening the sky was clear, and the comet appeared as a nearly round nebulosity of about  $1'$  in diameter, possessing a stellar nucleus of the thirteenth magnitude.

—On a method of reading large surfaces of mercury: A. Berget. A collimator with a well illuminated very narrow slit is placed behind the column to be read, and an ungraduated thermometer tube in front. A luminous line, the focal line of a cylindrical mirror, is formed, and ends with great sharpness at a fixed point, which can be read off in a cathetometer with an accuracy of 0.01 mm.—The attraction observed between liquid drops suspended in a liquid of the same density: V. Cremieu. Drops of olive oil, suspended in a mixture of alcohol and water of as nearly as possible the same density as the oil, ascend or descend in a vertical straight line, with extreme slowness, if precautions against changes of temperature and shaking are taken. If two or more drops are present in the dilute alcohol at the same time, there is an attraction between the two drops which is manifested by their following curved paths instead of vertically straight ones.—On the photogenic radio-active properties of calcined coral placed in a radiant vacuum and submitted to the influence of the kathode rays: Gaston Ségué. Amongst various substances examined calcined coral (carbonate of lime and magnesia) gave the most intense phosphorescence as measured by the action on a photographic plate. Phosphorescent coral excites the fluorescence of barium platino-cyanide screens, and is very rich in ultra-violet rays.—Concerning the action of very low temperatures on the phosphorescence of certain sulphides: F. P. Le Roux. The maximum potential light energy which can be induced in a given phosphorescent body by a given light is independent of the temperature. Variations of temperature can only have an influence on the velocity of transformation of the potential into the actual light energy.—On a supposed demonstration of the existence of the  $n$ -rays by photographic methods: M. Chanoz and M. Perrigot. The authors have repeated an experiment of M. Bordier's on the photographic detection of the  $n$ -rays emitted by tempered steel, with contrary results. They find that two equal masses of lead and tempered steel, placed identically on screens comparable as to thickness and insulation, never give different halos, whatever may be the duration of the exposure.—The special sensibility of the physiological ear for certain vowels: M. Marage.—On the fluorides of indium and rubidium: C. Chabrie and A. Bouchonnet. The fluoride of indium was prepared by dissolving the hydroxide of the metal in hydrofluoric acid, and was found on analysis to possess the composition  $\text{In}_2\text{F}_6 \cdot 18\text{H}_2\text{O}$ . It emits acid vapours, and is completely decomposed on ignition to redness. On treating rubidium carbonate with hydrofluoric acid and evaporating to dryness the acid fluoride  $\text{RbF} \cdot \text{HF}$  is obtained.—The limit of the reaction between diazobenzene and aniline: Léo Vignon. Aminoazobenzene does not react with diazobenzene either in aqueous or alcoholic solution. Aniline reacts with diazoaminoazobenzene chloride in presence of potassium carbonate giving a diazoamine.—Camphene, camphenylone, isoborneol, and camphor: L. Bouveault and G. Blanc. The tertiary alcohol, methylcamphenylol, was prepared from camphenylone by Grignard's reaction. The reaction of this alcohol with pyruvic acid at  $140^\circ$ – $150^\circ$  C. has been studied.—On the diastatic coagulation of starch: J. Wolff and A. Fernbach.—The estimation of carbon monoxide in confined atmospheres: Albert Lévy and A. Pécouli. The authors utilise the reaction first indicated by M. Gautier between carbon monoxide and iodic anhydride at  $80^\circ$  C., modifying the method by receiving the vapours of iodine in a small quantity of pure chloroform. The amount of iodine set free is ascertained calorimetrically by comparison with a set of sealed tubes containing known quantities of iodine. It is possible in this way to measure in four litres of air only down to  $1/200,000$  of carbon monoxide by volume. A test analysis with an artificially prepared atmosphere is given to show the accuracy of the method.

—On the rational estimation of gluten in wheaten flour: **E. Fleurent**. It is shown that by taking certain precautions as to the temperature and lime contents of the wash water, and fixing the time of washing, it is possible to obtain results by the mechanical method which agree well with the chemical method.—Physicochemical researches on hæmolytic: **Victor Henri**.—The comet *e* 1904, discovered December 28, 1904, at the Observatory of Marseilles: **M. Borrelly**.—The provisional elements of the new Borrelly comet (1904 December 28): **G. Fayet** and **E. Maubant**.—On the isochronism of the pendulum in the astronomical clock: **Ch. Féry**. For an amplitude between  $2^{\circ} 13'$  and  $2^{\circ} 29'$ , that is, for a variation of amplitude of about 9 mm., the variation of the rate was nil, or there was a minimum for the time of oscillation. This result is probably due to a want of isochronism of the escapement.—On the value of the magnetic elements on January 1: **Th. Moureaux**.—Osmotic communication in fishes between the internal and external media: **Jean Gautrelet**. Referring to a recent paper by M. Quinton, the author directs attention to a paper of his bearing on the same subject published in 1902.—On the infection of *Padda oryzivora* by *Trypanosoma paddae* and by *Halteridium Danilewskyi*: **M. Thiroux**.

## INDIA.

**Asiatic Society of Bengal**, December 7, 1904.—The lizards of the Andamans, with the description of a new gecko and a note on the reproduced tail in *Ptychozoon homocephalum*: **N. Annandale**. Out of the nine geckos recorded from the Andamans, five or possibly six would seem to have been carried thither by man. The remaining three are indigenous. One of the three is very nearly related to forms on the nearest mainland, the second has Malabar affinities, and the third Madagascan. The author describes *Gonatodes Andersonii*—a new species. The scales of the reproduced part of the tail, dorsal and ventral surfaces, of *Ptychozoon homocephalum* are slightly smaller than those of the uninjured part, and the dorsal tubercles are absent; also the loose membrane is narrower, asymmetric, and not lobed. This last point is important, as Müller had thought the lobes of specific importance.—The occurrence of an aquatic glow-worm in India: **N. Annandale**. A glow-worm larva of aquatic habit has been found in a tank in the neighbourhood of Calcutta. The only other aquatic glow-worm recorded was found in Lower Siam.

## DIARY OF SOCIETIES.

## THURSDAY, JANUARY 19.

ROYAL SOCIETY, at 4.30.—The Dual Force of the Dividing Cell. Part i.: The Achromatic Spindle Figure illustrated by Magnetic Chains of Force: **Prof. M. Hartog**.—Note on the Effects produced on Rats by the Trypanosomata of Gambia Fever and Sleeping Sickness: **H. G. Plimmer**.—Further Histological Studies on the Localisation of Cerebral Function. The Brains of Felis, Canis, and Sus, compared with that of Homo: **Dr. A. W. Campbell**.—Experiments on the Nature of the Oponic Action of the Blood Serum: **Dr. W. Bulloch** and **E. E. Atkin**.  
LINNEAN SOCIETY, at 8.—Botanical Collecting: **Dr. A. Henry**.—On the Cranial Osteology of the Families Osteoglossidae, Pseudotontidae, and Phacolepididae: **Dr. W. G. Ridewood**.

SOCIETY OF ARTS, at 4.30.—The Gates of Tibet: **Douglas W. Freshfield**.

## FRIDAY, JANUARY 20.

ROYAL INSTITUTION, at 9.—New Low Temperature Phenomena: **Sir J. Dewar, F.R.S.**

EPIDEMIOLOGICAL SOCIETY, at 8.30.

INSTITUTION OF MECHANICAL ENGINEERS, at 8.—Some Impressions of American Workshops: **A. J. Gimson**.—Waterworks Pumping Engines in the United States and Canada: **J. Barr**.—Some Features in the Design and Construction of American Planing Machines: **A. Kenrick, Jun.**.—Engines at the Power Stations, and at the St. Louis Exhibition: **A. Saxon**.

## MONDAY, JANUARY 23.

SOCIOLOGICAL SOCIETY, at 8.—Civics: as Applied Sociology, Part ii.: **Prof. Patrick Geddes**.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—The Great Zimbabwe and other Ancient Ruins in Rhodesia: **R. N. Hall**.

SOCIETY OF ARTS, at 8.—Reservoir, Stylographic and Fountain Pens: **J. P. Maginnis**.

## TUESDAY, JANUARY 24.

ROYAL INSTITUTION, at 5.—The Structure and Life of Animals: **Prof. L. C. Miall, F.R.S.**

INSTITUTION OF CIVIL ENGINEERS, at 8.—Notes on the Working of the Shone System of Sewerage at Karachi: **J. F. Brunton**.—The Sewerage of Douglas, Isle of Man: **E. H. Stevenson** and **E. K. Burstal**.

ANTHROPOLOGICAL INSTITUTE, at 8.30.—Annual General Meeting. President's Address, &c.

## WEDNESDAY, JANUARY 25.

SOCIETY OF ARTS, at 8.—London Electric Railways: **Hon. Robert P. Porter**.

## THURSDAY, JANUARY 26.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: On the Boring of the Simplon Tunnel, and the Distribution of Temperature that was Encountered: **Francis Fox**.—On the Comparison of the Platinum Scale of Temperature with the Normal Scale at Temperatures between  $444^{\circ}$  and  $-190^{\circ}\text{C.}$ , with Notes on Constant Temperatures below the Melting Point of Ice: **Prof. M. W. Travers, F.R.S.**, and **A. S. C. Gwyer**.—On the Modulus of Torsional Rigidity of Quartz Fibres, and its Temperature Coefficient: **Dr. F. Horion**.—On a Method of Finding the Conductivity for Heat: **Prof. C. Niven, F.R.S.**—Exterior Ballistics. "Error of the Day" and other Corrections to Naval Range-Tables: **Prof. G. Forbes, F.R.S.**—The Theory of Symmetrical Optical Objectives. Part ii.: **S. D. Chalmers**.—On the Drift produced in Ions by Electromagnetic Disturbances, and a Theory of Radio-activity: **C. W. Walker**.—Coloration of Glass by Natural Solar and other Radiations: **Sir William Crookes, F.R.S.**—On the "Blaze-Currents" of the Gall Bladder of the Frog: **Mrs. Waller**.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Fuel Economy in Steam Power Plants: **W. H. Booth** and **J. B. C. Kershaw**. (Conclusion of discussion.)

## FRIDAY, JANUARY 27.

ROYAL INSTITUTION, at 9.—The Life-History of the Emperor Penguin: **Dr. Edward A. Wilson**.

PHYSICAL SOCIETY, at 5.—Action of a Magnetic Field on the Discharge through a Gas: **Dr. R. S. Willows**.—Action of Radium on the Electric Spark: **Dr. R. S. Willows** and **J. Peck**.—The Slow Stretch in India-rubber, Glass, and Metal Wires when subjected to a Constant Pull: **P. Phillips**.—Determination of Young's Modulus for Glass: **C. A. Bell**.—Some Methods for Studying the Viscosity of Solids: **Dr. Boris Weinberg**.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Concrete-Making on the Admiralty Harbour Works, Dover: **T. L. Matthews**.

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